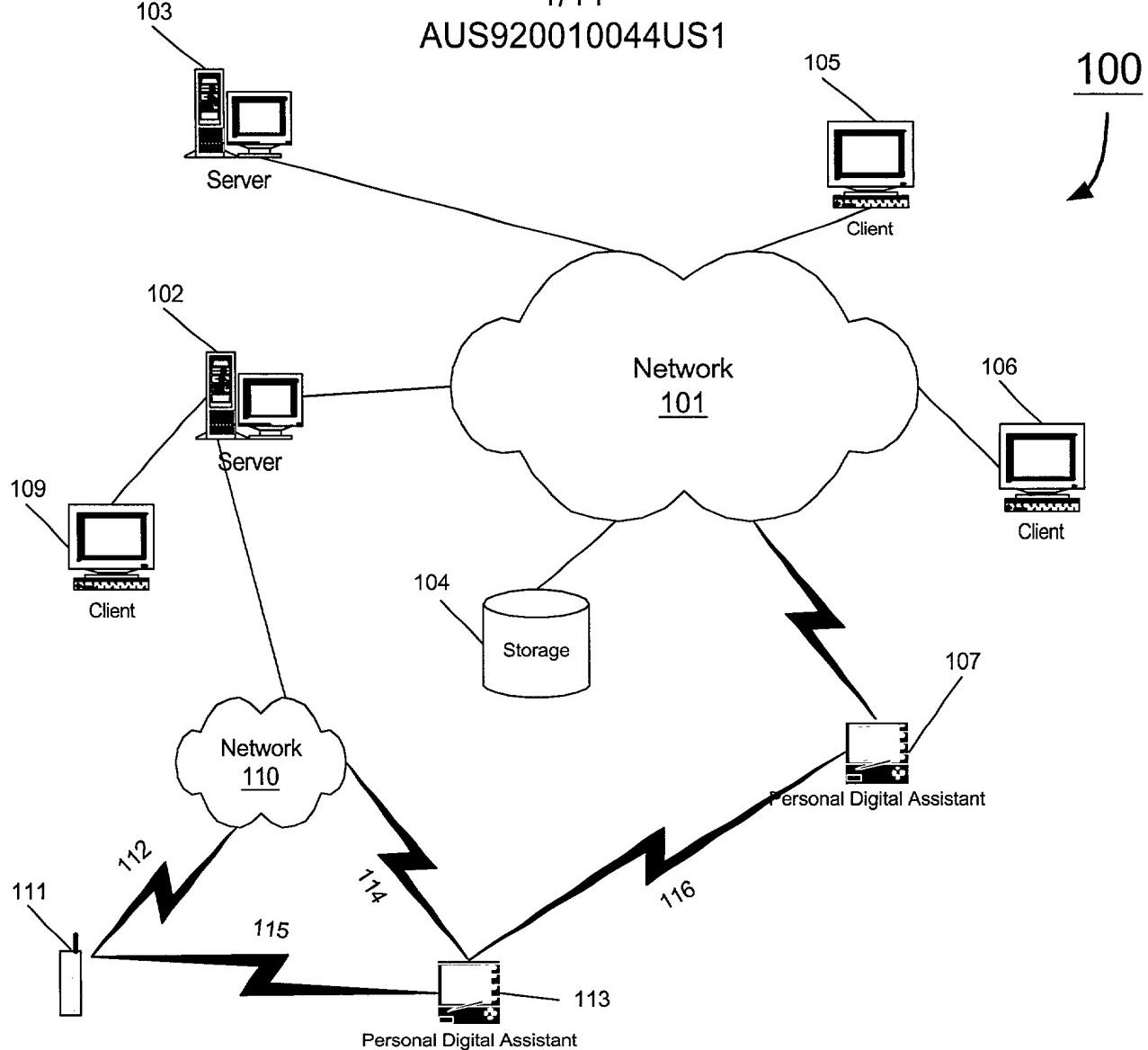


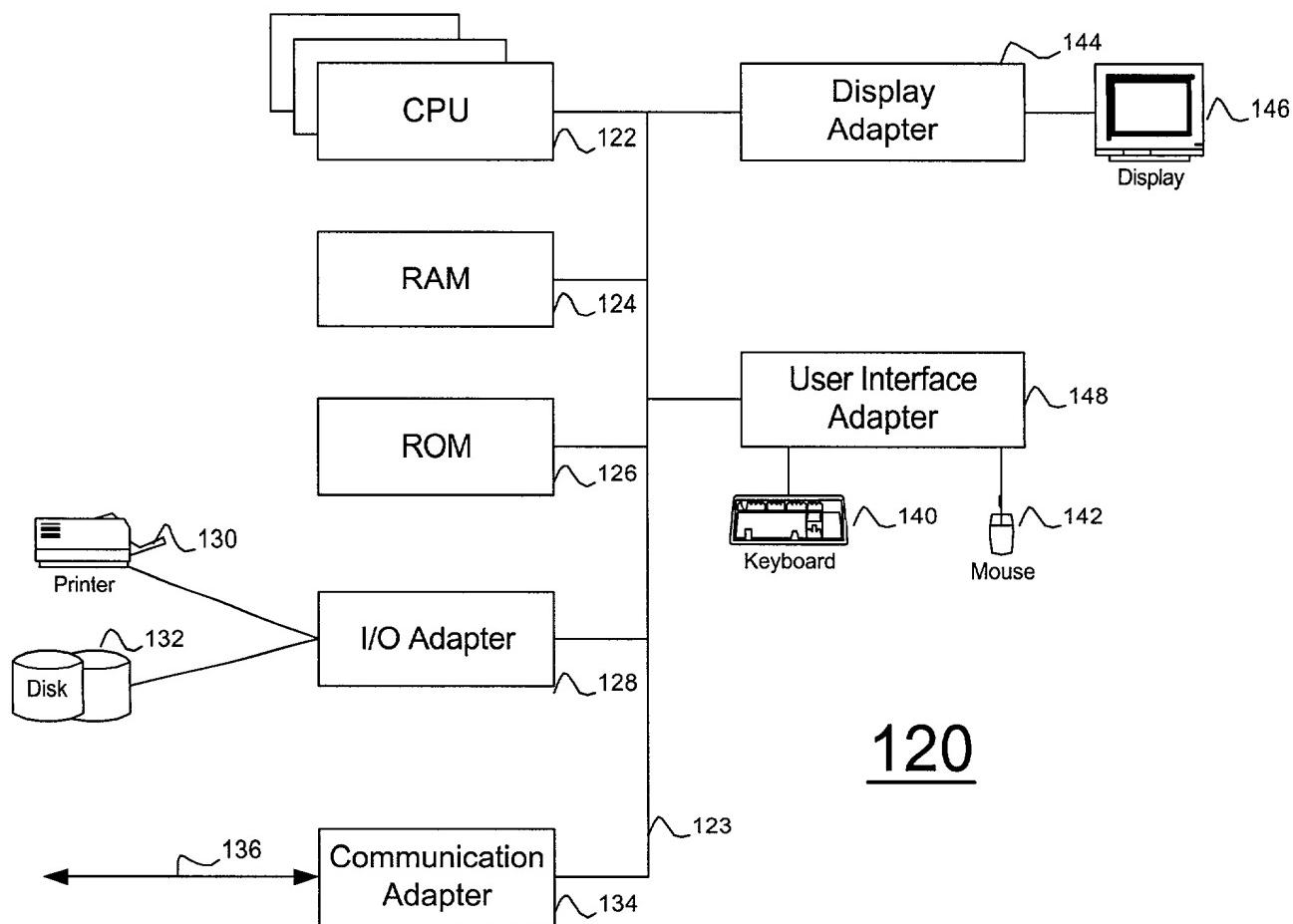
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1/11
AUS920010044US1



Prior Art

Figure 1A

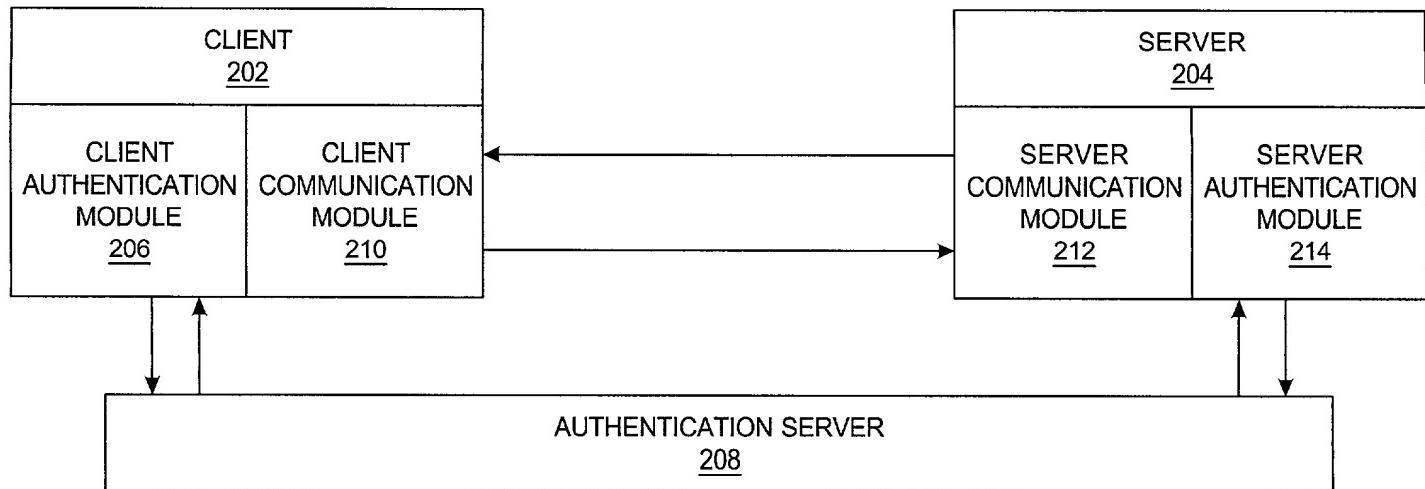


Prior Art

Figure 1B

200

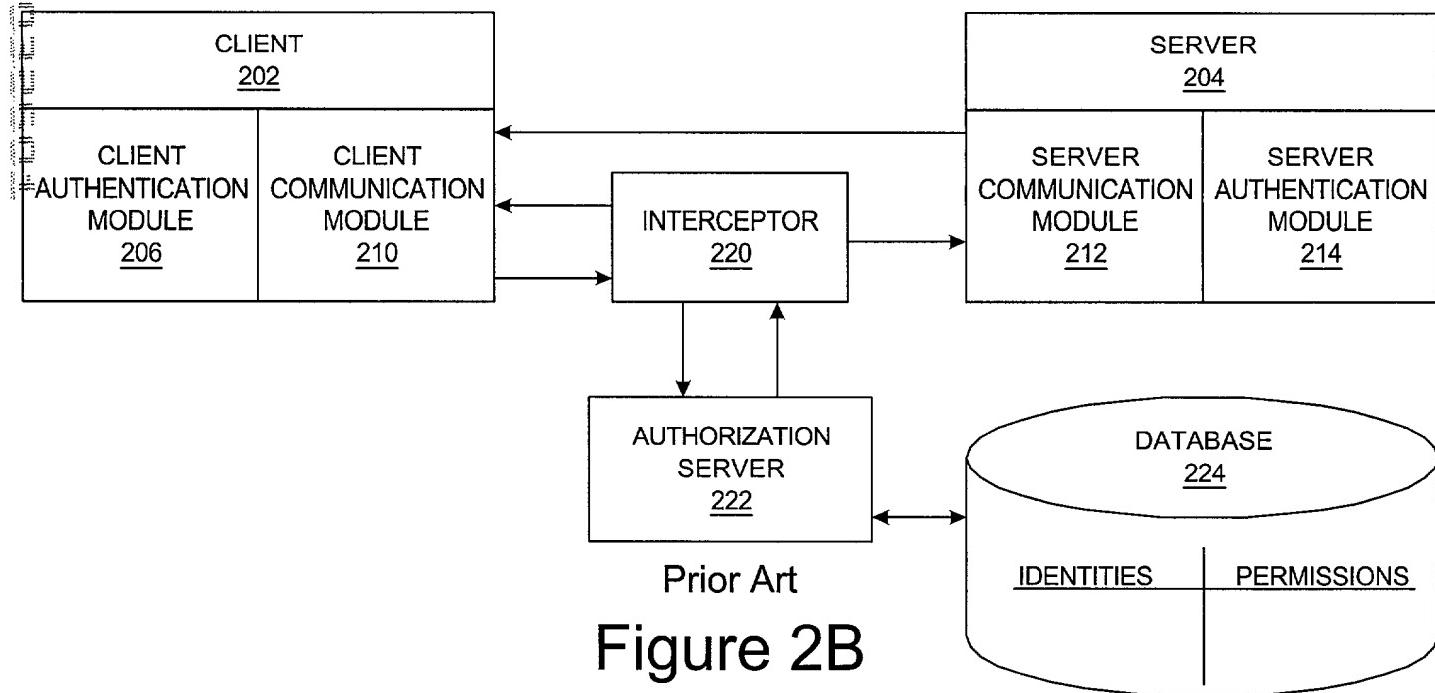
3/11
AUS920010044US1



Prior Art

Figure 2A

200



Prior Art

Figure 2B

300

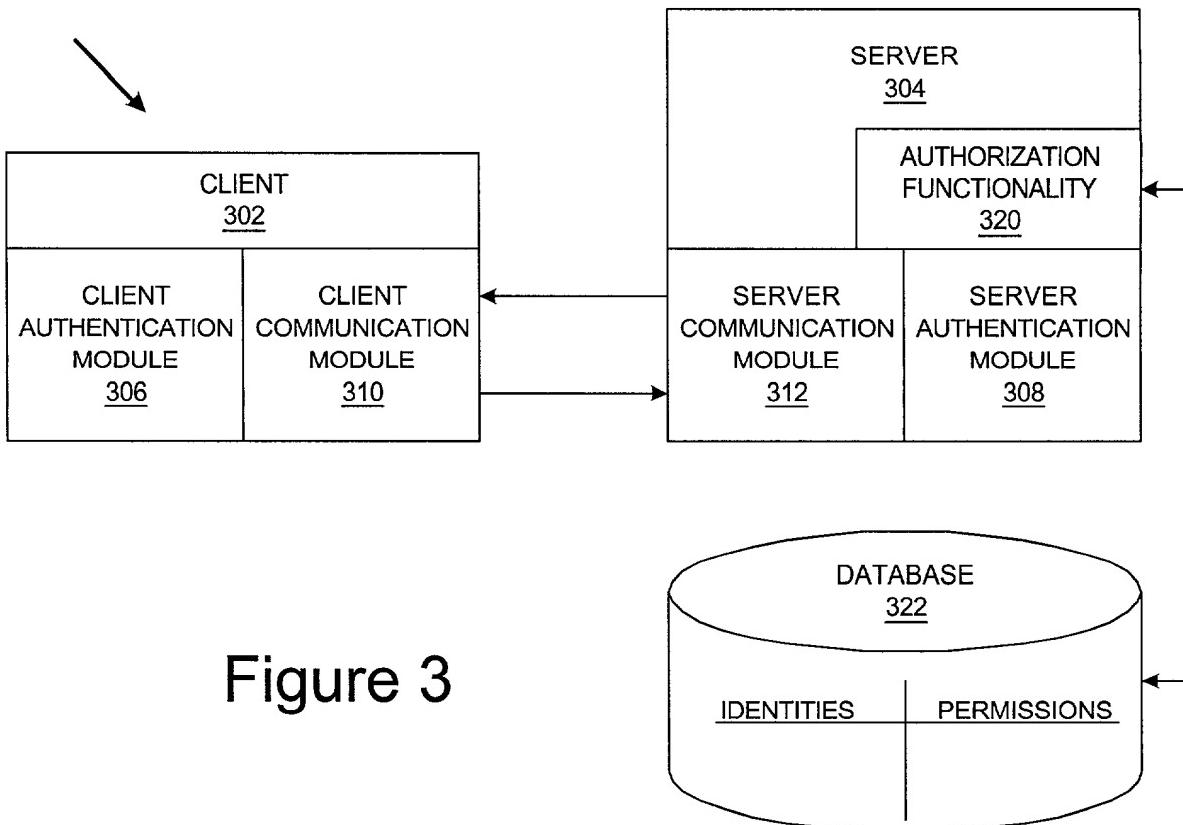


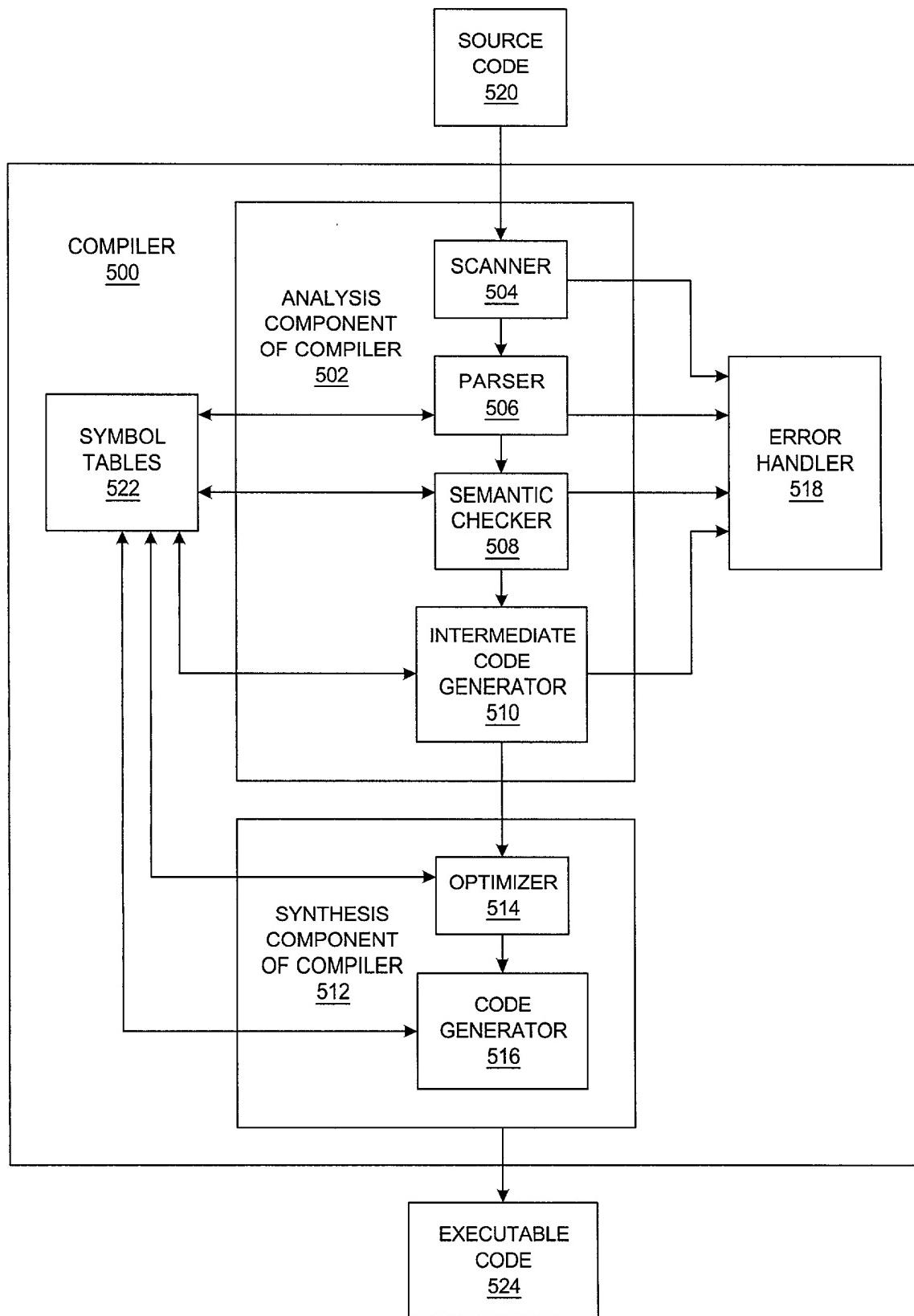
Figure 3

```
Class public ClientClassA {  
  
    Method A {  
        try {  
            ServerClassM.M( ); // Might throw an authorization exception.  
            // Try block successfully executes when  
            // invoked by entity with proper authority,  
            // such as BankManager  
        }  
        catch (AuthException e)  
        {  
            // Codepath not reached for BankManager role  
        }  
    }  
}  
  
Class public ClientClassB {  
  
    Method B {  
        try {  
            ServerClassM.M( ); // Might throw an authorization exception.  
            // Try block fails to execute when invoked  
            // by entity with improper authorization,  
            // such as BankTeller  
        }  
        catch (AuthException e)  
        {  
            // Codepath reached for BankTeller role  
        }  
    }  
}  
  
Class public ServerClassM {  
  
    408 —— Method M ( ) enforces ManagerAuthorization.AuthMethod  
}  
Class public ManagerAuthorization {  
  
    406      Method AuthMethod ( ) throws AuthException {  
                // Body of AuthMethod containing authorization process  
    }  
}
```

Figure 4A

```
Class public ClientClassA {  
  
    Method A {  
        try {  
            ServerClassM.M( ); // Might throw an authorization exception.  
            // Try block successfully executes when  
            // invoked by entity with proper authority,  
            // such as BankManager role  
        }  
        catch (AuthException e)  
        {  
            // Codepath not reached for BankManager role  
        }  
    }  
}  
  
Class public ClientClassB {  
  
    Method B {  
        try {  
            ServerClassM.M( ); // Might throw an authorization exception.  
            // Try block fails to execute when invoked  
            // by entity with improper authorization,  
            // such as BankTeller role  
        }  
        catch (AuthException e)  
        {  
            // Codepath reached for BankTeller role  
        }  
    }  
}  
  
Class public ServerClassM enforces ManagerAuthorization.AuthMethod { —— 412  
  
    Method M (){  
    }  
}  
  
Class public Manager Authorization {  
  
    Method AuthMethod ( ) throws AuthException {  
    }  
}
```

Figure 4B



Prior Art

Figure 5

dec → classdec
 classdec → **class** class_id **extends** class_id { { class_field } }
 602 — classdec → **class** class_id **extends** class_id **enforces** authMethod { { class_field } }

class_field → vardec
 class_field → method

608 — method → **method** id(tyfields) **enforces** authMethod

method → **method** id(tyfields) = exp
 604 — authMethod → **method** id(tyfields) = exp

method → **method** id(tyfields):type_id = exp
 606 — authMethod → **method** id(tyfields):type_id = exp

exp → **new** class_id
 exp → lvalue id()
 exp → lvalue id(exp {, exp})

Figure 6

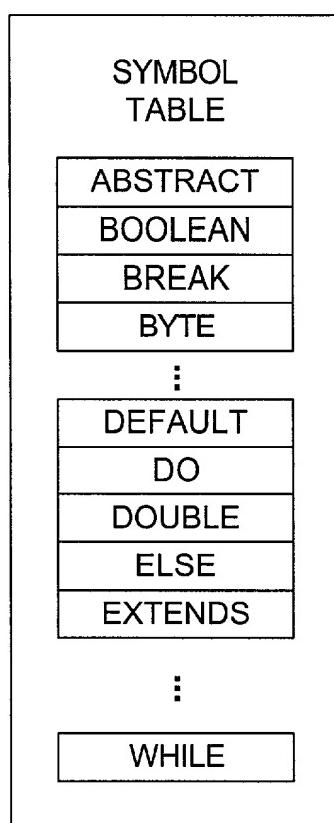


Figure 7A

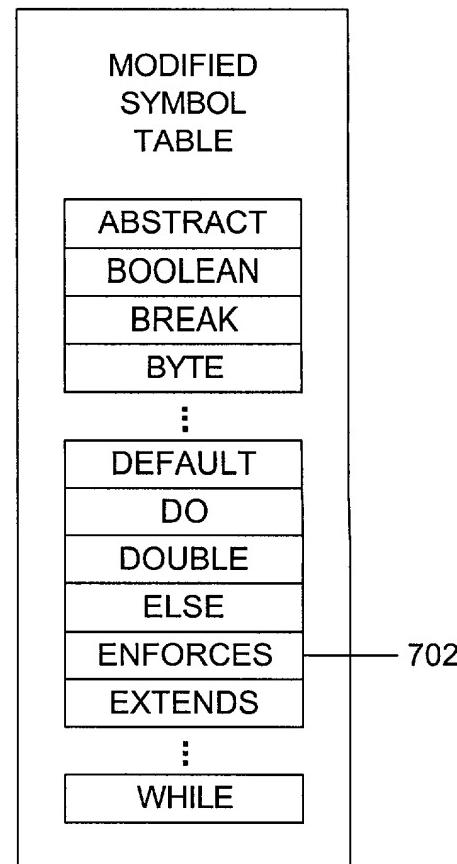


Figure 7B

```

802 —— class CC extends Object {
    method A ( ) = { SC:M( ) }
}

804 —— class SC extends Object enforces ACLClass:R {
    method M ( ) = { body of M }
    method F ( ) = { body of F }
}

806 —— class SCSC extends SC {
    method M ( ) = { body of M }
}

```

Figure 8

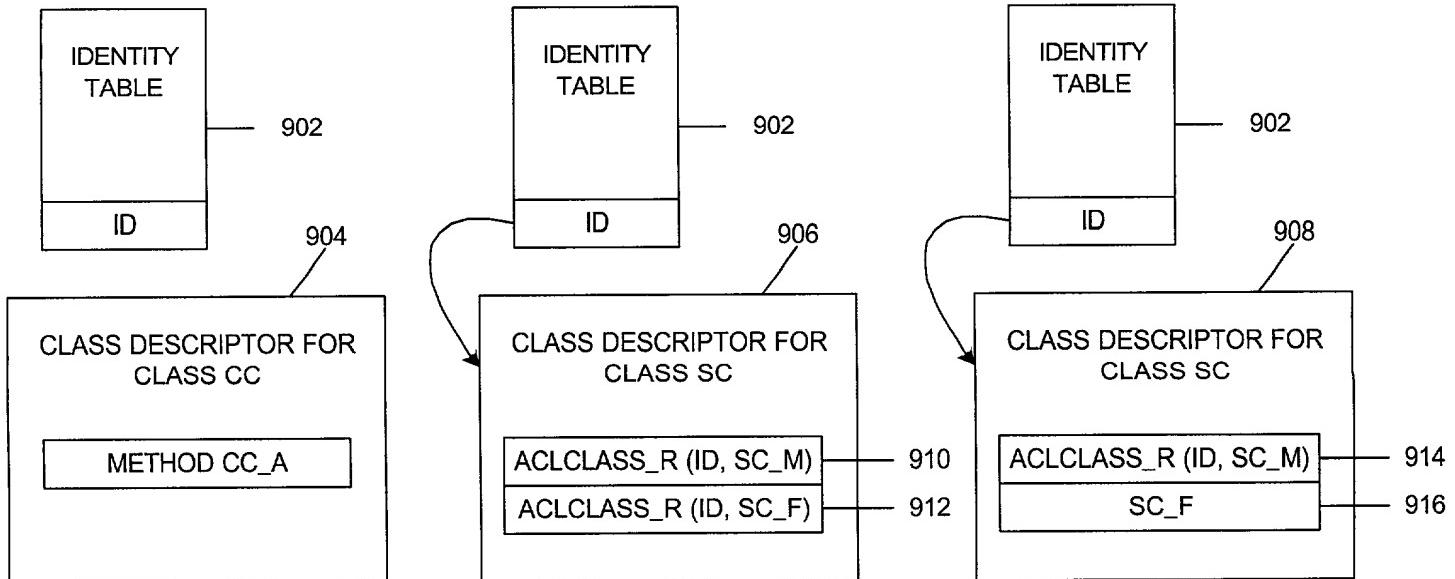


Figure 9A

Figure 9B

Figure 9C

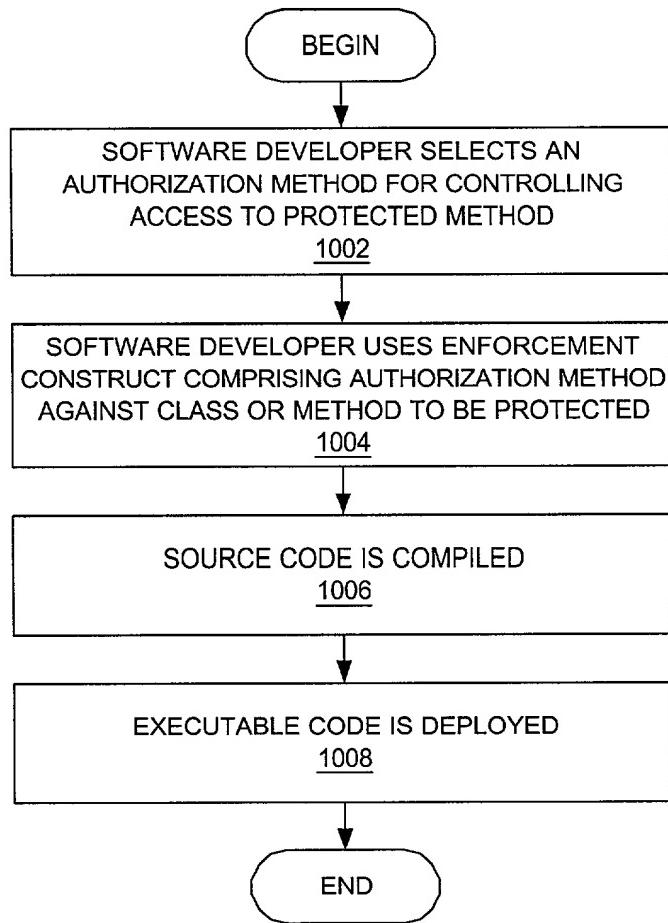


Figure 10A

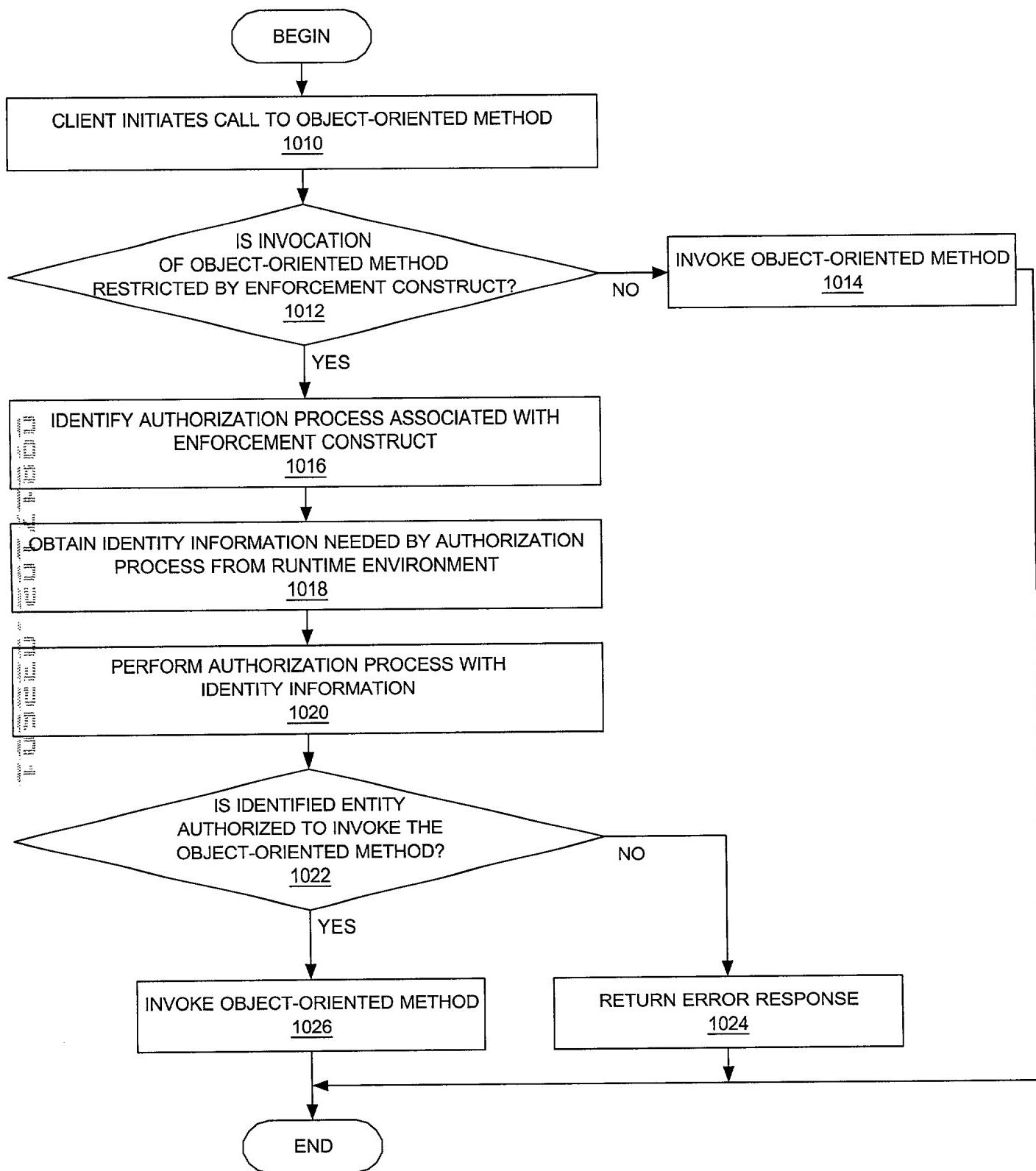


Figure 10B